

Source Number	Source Name	Permit Writer
01-0038	Northwest Pipeline - Baker Compressor Station	WELCH Doug
01-0038	Northwest Pipeline - Baker Compressor Station	WELCH Doug
03-2145	Willamette Falls Paper Co.	JACOBS Patty
03-2145	Willamette Falls Paper Co.	JACOBS Patty
03-2729	Northwest Pipeline - Oregon City Compressor Station	JACOBS Patty
04-0004	GP Wauna	GRAIVER David
04-0004	GP Wauna	GRAIVER David
04-0004	GP Wauna	GRAIVER David
04-0004	GP Wauna	GRAIVER David
04-0004	GP Wauna	GRAIVER David
04-0004	GP Wauna	GRAIVER David
09-0084	Gas Transmission Northwest - CS GTN-12	WEST Walt
09-0084	Gas Transmission Northwest - CS GTN-12	WEST Walt
10-0025	Roseburg Forest Products Dillard	TACCONI Janice
10-0025	Roseburg Forest Products Dillard	TACCONI Janice
10-0025	Roseburg Forest Products Dillard	TACCONI Janice
15-0004	Boise Cascade- North Medford	PETERSON Byron
15-0159	Biomass One	TACCONI Janice
15-0159	Biomass One	TACCONI Janice
18-0005	Gilchrist Forest Products (formerly Interfor)	HANNA Kenneth
18-0006	JELD-WEN, Klamath Falls	WEST Walt
18-0096	Gas Transmission Northwest - CS GTN-13	WEST Walt
18-0096	Gas Transmission Northwest - CS GTN-13	WEST Walt
21-0005	Georgia Pacific Toledo	EISELE Michael
21-0005	Georgia Pacific Toledo	EISELE Michael
21-0005	Georgia Pacific Toledo	EISELE Michael
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21-0005	Georgia Pacific Toledo	EISELE Michael
22-3501	Cascade Pacific Pulp Halsey	PURAM Yuki
22-3501	Cascade Pacific Pulp Halsey	PURAM Yuki
26-1865	EVRAZ	GRAIVER David
26-1876	Owens-Brockway Glass Container Inc.	YUN George
26-1876	Owens-Brockway Glass Container Inc.	YUN George
31-0006	Boise Cascade - Elgin	WELCH Doug
LRAPA #208850	International Paper, Springfield Mill	
LRAPA #208850	International Paper, Springfield Mill	

Emission Unit(s)
EU1 (compressor units C1, C2 and C3 combined)
EU2
Boiler 3
Boilers 1 and 2
EU1 - Ingersoll-Rand 412KVS (4SLB) engines 1 & 2
21 - Lime Kiln
33 - Power Boiler
Paper Machine 5: Yankee Burner
Paper Machine 6: Burners
Paper Machine 7: Burners
33 - Power Boiler
12A
12B
Boiler 1
Boiler 2
Boiler 6
Boilers 1-3
North Boiler
South Boiler
Boilers 1 and 2
Wood Fired Boiler BLRG
13C
13D
EU-118 Hardwood Chip handling
EU-1 Lime Kiln
EU-2 Lime Kilns
EU-3 Lime Kiln
EU-13 No. 1 Boiler
EU-13 No. 1 Boiler
EU-11 No. 4 Boiler
EU-18 No. 3 Boiler
EU-11 No. 4 Boiler
EU-13 No. 1 Boiler
Power boiler #1 (PB1EU)
Power boiler #1 (PB1EU)
10 - Reheat Furnace
A-Furnace
D-Furnace
Boilers 1, 2
Power Boiler EU-150A
Package Boiler EU-150B

Control Device
Low Emission Control (LEC)
Low Emission Control (LEC)
Improved LNB
LNB
Low Emissions Combustion (LEC) Retrofit
LNB
LNB/FGR
LNB/FGR
LNB/FGR
LNB/FGR
SCR
SCR
SCR
SNCR
SNCR
SNCR
SCR
SCR
SCR
ESP
SNCR - Ammonia
SCR
SCR
Baghouse
LNB
LNB
LNB
LNB with FGR
SCR
SCR
SNCR
SNCR
SNCR
LNB/FGR
SNCR
LNB
Catalytic Ceramic Filters with Lime & NH3 injection systems
Catalytic Ceramic Filters with Lime & NH3 injection systems
SCR
SCR
SCR

## Status Number

1 - cost effective

1 - cost effective

2 - needs more work; need direction

2 - needs more work; need direction

1 - cost effective

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1 - cost effective

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2 - needs more work; need direction

1 - cost effective

1 - cost effective

0 - facility agreed is cost-effective; proceed to install

0 - facility agreed is cost-effective; proceed to install

1 - cost effective

1 - cost effective

1 - cost effective

## Recommendation to Ali

cost of controls is effective

cost of controls is effective

We have no data about this one but it seems promising. An LNB is supposedly installed on this equipment. We recommend that Ali talks with plant manager. \$17,965/ton includes operating and maintenance costs

cost of controls is effective

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cost of controls is effective

cost of controls is effective

facility has agreed to install. cost of controls is effective.

cost of controls is effective

cost of controls is effective

cost of controls is effective

no cost information provided

cost of controls is effective

cost of controls is effective

cost of controls is effective

cost of controls is effective

no cost information provided

no cost information provided

no cost information provided

no cost information provided

no cost information provided

very close to \$10,000/ton. Review costs.

cost of controls is effective

cost of controls is effective

proceed with installation

proceed with installation

cost of controls is effective

cost of controls is effective

cost of controls is effective note: actual emissions are very low, so \$/ton at actuals is very high.

## Draft decision from Ali

pursue controls or PSEL reduction

pursue controls or PSEL reduction

request a look at improved LNB

phase out #6 fuel oil backup. Phase out the boiler (#1?) that is not being used currently. Look at LNB for

pursue controls or PSEL reduction

pursue installation

pursue installation

pursue installation

pursue installation

pursue installation

pursue installation or PSEL reduction

pursue installation or PSEL reduction

pursue installation

pursue installation

proceed with installation

ask if they can reduce PSEL by amount of the potential reductions

pursue installation

?

don't pursue?

pursue installation

pursue installation

pursue installation

pursue installation

pursue installation

pursue installation

pursue installation

pursue installation

pursue installation

pursue installation

[illegible]

## Second Request Response

Did not provide additional control cost information. Requested that Q/d be based on actual emissions  
Did not provide additional control cost information. Requested that Q/d be based on actual emissions

Joe has emailed Patty to ask for details about the quote.\$17,965/ton reduced based on vendor quote  
Did not provide additional control cost information. Requested that Q/d be based on actual emissions  
was not included in 4FA or subsequent DEQ request for more info. DEQ did cost analysis based on LNE  
was not able to get additional vendor data. Use previous cost/ton data.

was not able to get additional vendor data. Use previous cost/ton data.Note: there are multiple burne  
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was not able to get additional vendor data. Use previous cost/ton data.

Input from EPA: <<<Unit 12A – The \$/ton value increased from \$4,335/ton to \$5,885/ton. The most si  
Input from EPA:<<<Unit 12B – The \$/ton value increased from \$7,390/ton to \$11,237/ton. Again the S  
Offered to reduce PSELs. Stated that SNCR was not a good idea because of impact of ammonia slip on  
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Offered to reduce PSELs. Stated that SNCR was not a good idea because of impact of ammonia slip on  
Facility claims a cost of \$9,000/ton based on PSEL. But, they didn't provide a full cost calculation, and t  
Provided vendor quote and analysis that concluded \$8,662/ton. After adjusting to 30 year lifetime and  
Provided vendor quote and analysis that concluded \$8,662/ton. After adjusting to 30 year lifetime and

"In regard to the installation of ESP technology for improved PM emissions control,Interfor agrees that  
Vendor Wellons responded that they do not offer ammonia-based SNCR systems, due to issues with st  
\$8,714/ton reduced after adjustment to 90% control efficiency.Input from EPA:<<<Unit 13C – The \$/to  
\$8,302/ton reduced after adjustment to 90% control efficiencyInput from EPA:<<<Unit 13D – The \$/to  
Proposed to reduce the PSEL emission rate for this EU from 57.9 tpy to 3.4 tpy, by switching to an NC/  
GP Toledo acknowledged receiving a vendor quote for LNB on the lime kiln burners, for "typically 130  
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GP Toledo acknowledged receiving a vendor quote for LNB on the lime kiln burners, for "typically 130  
provided +/- cost estimate based on vendor quote.

said they were unable to get a vendor quote in time

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said they were unable to get a vendor quote in time

took cost for a 31 MMBTU/hr boiler and adjusted it for a 236 MMBTU/hr one. May overstate the cost  
Did not provide a vendor quote. Noted that Power Boiler #1 runs at varying loads.

EVRAZ said that LNB were already installed, and did not provide a cost estimate for improved LNB.But

claimed cost estimate of \$9,993/ton based on a quote for Medford facility. Did not provide a copy of t  
2nd response stated that cost was \$22,924/ton removed at actuals. However, they did not provide de  
2nd response stated that cost was \$655,241/ton removed at actuals. However, they did not provide de



## Comments

This estimate adjusted for interest rate and lifetime of control only. Further adjustments likely appropriate.

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Boiler reportedly has LNB but there are improved LNB available.

WFPCo. proposed LNB retrofit for Boilers 1 & 2. Assumptions were changed in their cost analysis as follows.

NWP - OCCS proposed LEC Retrofit add-on controls for an 80% NOx reduction. The SO2 and PM were

based on cost estimates provided by other facilities.

I can get \$2,490/ton by using vendor advertised NOx outlet and correcting NOx inlet to value in most recent

The previous 4FA submittal used LNB/FGR costs from an actual vendor quote obtained in December 2003.

The previous 4FA submittal used LNB/FGR costs from an actual vendor quote obtained in December 2003.

The previous 4FA submittal used LNB/FGR costs from an actual vendor quote obtained in December 2003.

Adjusted interest rate from 5% to 3.25% and control equipment life from 20 years to 30 years.

Adjusted interest rate from 5% to 3.25% and control equipment life from 20 years to 30 years.

Used 2003 EPA memo for cost estimate @\$1700/MMBtu/hr, and 25% control efficiency. Adjusted for

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Used 2003 EPA memo for cost estimate @\$1700/MMBtu/hr, and 25% control efficiency. Adjusted for

Boilers 1-3 are currently controlled by a Dry ESP. The SCR would be located after the ESP.

Changed equipment life from 20 to 30 years. Changed emissions basis from actuals to potential. As requested.

Adjusted the interest rate from 4.75% to 3.25% and the equipment life from 10 yrs to 30 yrs. The comparison

Adjusted interest rate from 5% to 3.25% and control equipment life from 20 years to 30 years.

Adjusted interest rate from 5% to 3.25% and control equipment life from 20 years to 30 years.

The current control efficiency is 97.9% based on DEQ emission factors on EF02 and EF03. Future control

% control efficiency is based on 2013 source test (188 ppmb @10% O2) compared to the 130 ppmv @

% control efficiency is based on 2013 source test (188 ppmb @10% O2) compared to the 130 ppmv @

% control efficiency is based on 2013 source test (188 ppmb @10% O2) compared to the 130 ppmv @

Removed the instrumentation cost because the cost to purchase already included labor, materials and

Changed the retrofit factor to 1 (average) Changed estimated equipment life to 30 years Changed the interest

control efficiency of 59% calculated using the current emissions factor (0.196 lb/MMBTU) compared to

other control devices including "Dry Scrubber + ESP" and "Dry Scrubber + ESP + SCR" also included in 4

other control devices including "Dry Scrubber + ESP" and "Dry Scrubber + ESP + SCR" also included in 4

Eliminated Low NOx and water/steam injection because these methods don't work well in wet-stoker

Permit Writer: Kelly Conlon Boiler has no controls and permitted to burn #6 fuel oil. FAA Boiler Max Heat

Permit Writer: Kelly Conlon NSPS Boiler has LNB w/FGR. FAA Boiler Max Heat input & fuel use appear in

Target Pollutant	Control Efficiency	\$/ton reduced	Total tons/year reduced (PTE)
NOx	80.00%	\$ 4,258	351.2
NOx	80.00%	\$ 5,495	80
-			
NOx	45.00%	\$ 17,965	27.5
NOx	80.00%	\$ 3,285	273.52
NOx	52.00%	\$ 6,078	46
NOx	64.00%	\$ 3,289	378.4
NOx	71.00%	\$ 8,727	21.45
NOx	78.00%	\$ 5,969	81.96
NOx	78.00%	\$ 5,895	85.53
NOx	90.00%	\$ 7,907	532
NOx	75.00%	\$ 5,885	
NOx	75.00%	\$ 11,237	86.025
NOx	25.00%	\$ 3,789	106
NOx	25.00%	\$ 3,628	113
NOx	25.00%	\$ 3,201	183
NOx	75.00%	\$ 4,125	160
NOx	90.00%	\$ 4,714	210
NOx	90.00%	\$ 4,714	210
PM10	84.00%	\$ 6,761	158
NOx	30.00%	\$ 8,903	21.53
NOx	75.00%	\$ 8,714	81.525
NOx	75.00%	\$ 11,237	
PM10	100.00%		48
NOx	31.00%	\$ 7,744	22
NOx	31.00%	\$ 7,744	22
NOx	31.00%	\$ 7,744	22
NOx	78.60%	\$ 6,487	176
NOx	90.00%	\$ 7,365	201
NOx	90.00%	\$ 8,713	197
NOx	45.00%	\$ 5,891	48
NOx	45.00%	\$ 4,859	98
NOx	45.00%	\$ 3,739	101
NOx	64.00%	\$ 10,559	85.37
NOx	45.00%	\$ 7,644	60
NOx	59.00%	\$ 6,728	233
multiple	90.00%	\$ 3,994	257.82
multiple	90.00%	\$ 4,202	221.94
NOx	75.00%	\$ 9,993	121
NOx	90.00%	\$ 4,308	786.3
NOx	90.00%	\$ 7,304	268

